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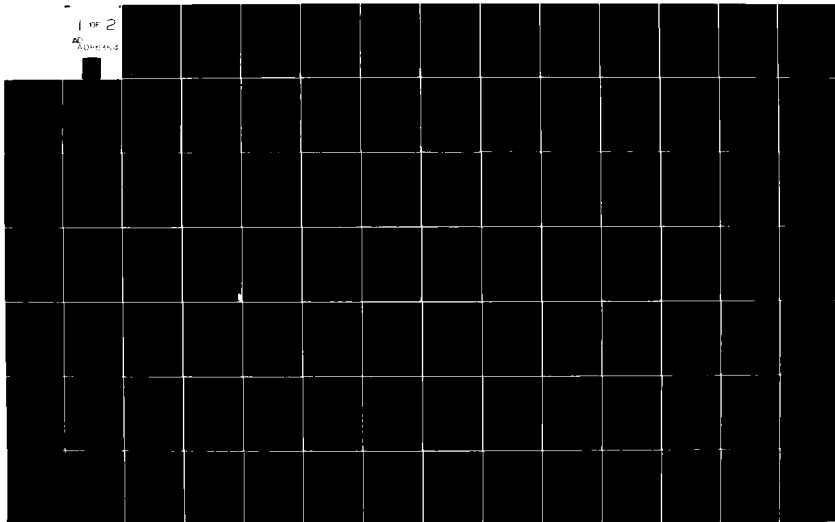
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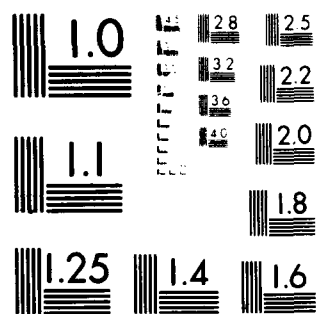
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**GRAPH - AN INTERACTIVE COMPUTER PROGRAM USED FOR
TECHNICAL PLOTTING**

This Report Supersedes AFAPL-TR-78-90 Dated November 1978

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Sandra K. Drake
Propulsion Branch
Turbine Engine Division

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TECHNICAL REPORT AFAPL-TR-78-90

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Final Report, for Period 1 Jul 1977 to 1 Aug 1978

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This report has been reviewed by the Office of Public Affairs (ASD/PA) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

Shondia K. Drake

Project Engineer
Propulsion Mechanical Design
Components Branch
Turbine Engine Division

P. J. Gershon

Technical Area Manager
Propulsion Mechanical Design
Components Branch
Turbine Engine Division

FOR THE COMMANDER

David H. Quick

DAVID H. QUICK, Lt Col, USAF
Chief, Components Branch
Turbine Engine Division

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) On-Line plotting TEK4010 plotting Graph preparation Report graphs		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This technical report describes a computer program "graph" which supplies a capability to do efficient plotting of all types of analytical data in a manner suitable for direct substitution into technical papers and articles. "DISSPLA", a prepackaged set of subroutines from Integrated Software systems Corporation was used in creation of "graph". Input is designed for the TEK4010 on-line computer terminal. Style and format of the created plot is specified by the user through interactive questions and answers. Options include special alphabets, curve fitting procedures, axis labeling and scaling, and the use of multi-curves.		

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FOREWORD

This report covers work carried out by the author during her cooperative work quarters in the Turbine Engine Division of the Aero Propulsion Laboratory, Air Force Wright Aeronautical Laboratories, Wright-Patterson Air Force Base, Ohio. The objective of this effort was to obtain Calcomp plots from a computer program suitable for direct substitution into papers for publication.

This report supersedes AFAPL-TR-78-90 dated November 1978. By adding additional overlays, the computer program has been modified to reduce the computer storage space required, thus allowing the use of a job number with a field length of 60,000 octal. When reviewing the data, the option to add or delete data points with an automatic reordering overlay has been added. These changes have altered SECTION III - PROGRAM USAGE by changing the the question numbering, and APPENDIX B - PROGRAM LISTING by including the added overlays. SECTION II and the examples in APPENDIX D have also been updated to include these changes.

The author wishes to express her appreciation to the following individuals for their support in supplying information for this program, Dr. James MacBain, Doretta Holland, and Richard Hill.

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SECTION I

INTRODUCTION

GRAPH is a plotting program which has been written to aid the engineer in plotting analytical data. It was programed according to the format requirements of a CDC6600 via a TEKTRONIX 4010 on-line computer terminal. It has been generated from a pre-packaged set of subroutines entitled Display Integrated Software System and Plotting Language (DISSPLA) (Reference 1), utilizing only a small portion of the subroutines offered.

GRAPH has been set up with a series of overlays (Reference 2), each of which is used for various general curve options or for a specific style curve. The TEK4010 is limited to programs with 100,000 octal or less; therefore overlays were used where possible to limit the core requirements of GRAPH.

The subroutines of DISSPLA must be called at the proper levels and several of these must remain resident in memory. If these subroutines of DISSPLA appeared in overlays that may have been by-passed, it would cause a fatal programing error. A brief description of each subroutine used from DISSPLA can be found in APPENDIX C.

A flow chart of the computer program is given in APPENDIX A, followed by the computer listing in APPENDIX B. A complete example of each style curve and curve option is given in APPENDIX D.

The program offers unique characteristics that allow the plots to be suitable for use in a paper for publication without having to be redrawn by an artist.

The following list contains all the capabilities and options of the program.

Style

- Upper and Lower Case Letters
- English or Greek Alphabets
- Subscript and Superscript Numbering
- Plain or Bold Face Letters
- Plot Heading
- Axes Labeling
- Curve Labeling (Legend)

Output

- Maximum of 5 Curves
- Axes Scaling
- Linear Plotting
- Logarithmic Plotting
- Semi-Logarithmic Plotting
- Least-Squares Fit to the 6th Order
- Smooth Curve Fitting
- Straight Line Between Points
- Plotting of Data Points Only
- Cal-Comp Replication

For further information or copies of the program, contact AFWAL/POTC.

SECTION II

GRAPH-PROGRAM DESCRIPTION

To develop a better understanding of the format used in setting up GRAPH, each author written overlay and subroutine is described as to its specific option. A description of each DISSPLA subroutine can be found in APPENDIX C.

The main overlay, PROGRAM PLTD, is the body of the program. Common blocks are used for communication between the main overlay and the other overlays and subroutines. Logic statements within the main overlay are used to call or by-pass the primary and secondary overlays as they are needed for style and output of the plot. Actual plotting is done from the main overlay by use of a System Subroutine, CCALL, which inputs the proper control cards without having to terminate the program.

SUBROUTINE NEWPAGE is used to call the necessary subroutines from the Tektronix Library that are used to reset the page after several questions have appeared on the screen.

PROGRAM ALPHA, Overlay (1,0), allows the use of special alphabets. These include upper and lower case Greek, lower case standard, and the use of superscripts or subscripts. These alphabets require the use of special characters designated by the DISSPLA subroutine, MXIALF.

PROGRAM LABSZE, Overlay (2,0), is called to input the Axes characteristics, the Title, which has a maximum of 45 characters, the X and Y Labels, which have a maximum of 59 characters each, the X axis length, maximum of 8.5 inches, and Y axis length, maximum of 9.5 inches. The labels will be centered according to the axes lengths by using a \$ (dollar sign) as the last character, and setting the number of characters equal to 100 in DISSPLA subroutine TITLE. This is a self counting option of

DISSPLA. The \$ is input by PROGRAM LABSZE for user convenience.

PROGRAM LIN, Overlay (3,0), is called when a linear plot is chosen. The minimum and maximum X and Y data values must be input. These values are used in determining the axes intervals by use of a self scaling routine, SCALE, if the user opts not to input the interval size. The option to divide these intervals into subdivisions also exists.

PROGRAM LOG, Overlay (4,0), is called when a log plot is chosen. Input necessary for this overlay includes the minimum X and Y values greater than zero, and the X and Y log cycle lengths in inches per cycle.

PROGRAM SEMI, Overlay (5,0), is used to call either Overlay (5,1), used for X Semilogarithmic plotting, or Overlay (5,2), used for Y Semilogarithmic plotting.

PROGRAM XSML, Overlay (5,1), is called for Semilogarithmic type axes. The semilogarithmic data necessary includes the minimum X value greater than zero, the minimum Y value, and the X log cycle length in inches per cycle. The self scaling option is not available for nonlinear plotting, therefore the Y step size must be input. The Y axis can be divided into subdivisions by inputting the number of minor ticks per Y division.

PROGRAM YSML, Overlay (5,2), is called for Y Semilogarithmic type axes. Necessary data follows the same format as for PROGRAM XSML interchanging X for Y and Y for X.

PROGRAM LSF, Overlay (6,0), is called when a least squares curve fit is desired. Curve fitting up to the sixth degree can be requested. System Subroutine PLSCF is called to calculate the least square coefficients. These values can then be reviewed. The coefficients are used to calculate

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the new Y array of values. The adjusted data that is to be plotted can then be reviewed, but not changed.

PROGRAM DAT, Overlay (7,0), is for input of data pairs for the curve and correction of the data. There is a limit of 30 pairs per curve. Data can be input in any format, with X in ascending order, and alternating X, Y values, (X1,Y1,X2,Y2,.../). The / (slash symbol) must appear at the end of a string of data pairs to signal to the computer that you are finished with your input. The user has the option to review the data and if any are incorrect, to add, delete or change, from one to all of the data pairs. If only a few pairs need be corrected, the data point number must be input, then the corrections are made one at a time. If more than half the data need be corrected, all of the data must be retyped. This was done because of limited storage space. The data can be reviewed after the corrections have been input to make sure all pairs are now correct. Corrections can be made until all of the data is correct.

PROGRAM REORDER, Overlay (7,1), is called when corrections are made to the data. It's function is to reorder the data, if necessary, so that X is in ascending order.

PROGRAM ONE, Overlay (10,0), contains two DISSPLA subroutines. These subroutines are used to set the page size and to remove the frame type border. Because these subroutines are not referenced by any other DISSPLA subroutines, they do not need to be in memory at all times. These subroutines were called within an overlay to reduce the continuous memory needed by the main overlay.

PROGRAM SYMB, Overlay (11,0), is used to determine the appearance of the curve. In DISSPLA there are 14 symbols, with integers 1-14 corresponding to a different symbol. If symbols are desired, an integer value

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must be typed in. This overlay is also used to determine whether the data points are connected by a smooth curve, a straight line, or least squares curve fitting. The option for no curve fitting, only symbolized data points, also exists.

PROGRAM LEGG, Overlay (12,0), is called only when a symbol is used on a curve. It is called after each symbol is designated to input the message for that curve. The message can have a maximum of 39 characters but should be limited to avoid overwriting the curve.

PROGRAM LEGED, Overlay (13,0), is used to input the position of the legend on the plot. Dimensions are in inches from the physical origin of the plot.

SECTION III

GRAPH - PROGRAM USAGE

Each question is listed below in the order of appearance on the Tektronix 4010 screen. The TEK4010 unit was used because of its advantage of interacting with the computer program while it is executing on the CDC6600 computer. Data can be input and corrected by a series of questions. Many of the questions can be answered by a Y for YES or an N for NO. Questions requiring numerical answers have either (F.P.), FLOATING POINTS, or (I), INTEGER, following them indicating which kind of value is required. Possible answers to loops are in brackets with each set of questions shown. To LOGIN, the user must use a job number with a field length of 100,000. The program must then be attached.

COMMAND - ATTACH, CARD, GRAPH, CY=1, ID=P710627, SN=AFAPL.

COMMAND - CARD.

1. INPUT DATA FOR NEW CURVE (Y OR N)?

If the answer is affirmative, program continues, creating a plot file.

If the answer is negative, see question 16.

2. DO YOU WANT STANDARD OR BOLD TYPE? INPUT S OR B -

This decides which style of writing is to be used on the plot.

[S] Default style of writing. It has limited characters and is a much faster style. See Example 1 Appendix D.

[B] Small complex style of writing. It is suitable for publication and takes more space per letter. See Example 2 Appendix D.

3. ARE YOU USING THE SPECIAL ALPHABETS (Y OR N)?

An affirmative answer will signal the subroutines for the escape characters. This list can be found in Example 1 in Appendix D.

4. INPUT HEADING (MAX 49 CHARACTERS) -

Type in any letter/number combination with the option of the lettering scheme, that has a maximum of 49 characters for standard lettering and 42 for bold lettering. The heading will be centered with respect to the X-axis length.

5. LABEL FOR X-AXIS (MAX 59 CHARACTERS) -

Type in the label using the same format as for the heading with a maximum of 59 characters.

6. LABEL FOR Y-AXIS (MAX 59 CHARACTERS) -

This, too, has the same format as the heading and X label with a maximum of 59 characters.

7. INPUT X-AXIS LENGTH (MAX.=8.5 INS) (F.P.) -

Input horizontal axis length.

8. INPUT Y-AXIS LENGTH (MAX.=9.5 INS) (F.P.) -

Input vertical axis length.

9. IS THIS A LINEAR, LOG, OR SEMILOG PLOT?

INPUT LIN, LOG, OR SML -

Program will continue with either linear, logarithmic or semilog type data questions.

[LIN]

9.1.1 INPUT X MIN AND X MAX VALUE (F.P., F.P.) -

9.1.2 INPUT Y MIN AND Y MAX VALUE (F.P., F.P.) -

These values for both X and Y should be the extreme values taken from the entire range of data. They are used to compute the axis intervals.

9.1.3A INPUT X STEP SIZE (Y OR N)?

[N] A negative answer will signal a self-scaling feature "SCALE" from DISSPLA. Step intervals will be scaled

with respect to the axis length and the axis limits, interpolating the given limits to make reasonable step intervals. For example, if axis length is 4 ins. and the min. and max. values are 0.12 and 3.83, axis numbering will start at 0. and end at 4. and the step interval will be one unit per inch.

[Y]

9.1.3B STEP SIZE (UNITS/DIV) (F.P.) =

Input the step interval in units to divide the axis into equal divisions. DISSPLA will use the min and max values as given without interpolating. For example, if axis length is 6 ins. and the min and max values are 0., 80., a [10] would put ten units every .75 inch.

9.1.4A INPUT Y STEP SIZE (Y OR N)?

Whether X is self-scaled or input, Y can be self-scaled by a negative response or input by an affirmative response.

[Y]

9.1.4B Y STEP SIZE (UNITS/DIV) (F.P.) =

Same format as for X.

9.1.5 INPUT THE NO. OF MINOR TICKS PER X DIV (I) -

To divide each interval into subsections, type in an integer value. The integer typed in should be one more than desired, i.e., to show three minor ticks, type in 4; thus dividing the section into fourths, (keeping in mind that a major tick mark is always placed at each division mark, this being one of the 4 when using the minor tick option). If only the major tick is desired, type 0.

9.1.6 INPUT THE NO. OF MINOR TICKS PER Y DIV (I) -

Same format as for X.

[LOG]

9.2.1 INPUT THE MIN X AND Y VALUES > 0 . (F.P.,F.P.) -

9.2.2 INPUT X AND Y LOG CYCLE LENGTHS $\neq 0$.

(INS/CYCLE) (F.P.,F.P.) -

Input the length of the log cycle in inches, i.e.,
if axis length is six inches and log cycle length
is 2 inches, 3 log cycles will be drawn.

[SML]

9.3 IS PLOT LOG IN X OR LOG IN Y? INPUT X OR Y -

[X] axis will have log scaling and Y axis linear scaling.

9.3.1A INPUT THE MIN X VALUE > 0 . (F.P.) -

9.3.1B INPUT THE MIN Y VALUE (F.P.) -

9.3.1C INPUT X LOG CYCLE LENGTH $\neq 0$. (INS/CYCLE) (F.P.) -

Type in plot characteristics.

9.3.1D INPUT Y STEP SIZE (UNITS/INCH) (F.P.) -

The self-scaling feature is not available for semilog
type plotting. Step intervals will be placed every inch.

9.3.1E INPUT THE NO. OF MINOR TICKS PER Y DIV (I) -

Same format as for LIN type plot.

[Y] axis will have log scaling and X axis linear scaling.

9.3.2A INPUT THE MIN X VALUE (F.P.) -

9.3.2B INPUT THE MIN Y VALUE > 0 . (F.P.) -

9.3.2C INPUT Y LOG CYCLE LENGTH $\neq 0$. (INS/CYCLE) (F.P.) -

9.3.2D INPUT X STEP SIZE (UNITS/INCH) (F.P.) -

9.3.2E INPUT THE NO. OF MINOR TICKS PER X DIV (I) -

Type in plot characteristics.

10. HOW MANY CURVES PER PLOT (MAX=5) (I)?

11. INPUT DATA FOR CURVE #I (X1,Y1,X2,Y2,... END WITH /) -

Up to 30 pairs of data can be input in any format. All of the data must be typed in for the first curve. For multiple curves, constant X or Y values can be omitted by leaving a space separated by a comma.

12. REVIEW DATA (Y OR N)?

An affirmative answer will print out three columns of data in I2, 2F15.5 format.

I= X= Y=

12.1 IS DATA ACCEPTABLE (Y OR N)?

[N]

12.2 DO YOU WISH TO DELETE, ADD, OR CHANGE POINTS (D, A, OR C)?

Data points can be deleted or added to change the total number of points. Each point can be changed if input incorrectly. OVERLAY REORDER will be called to insure that X is in ascending order.

[C]

12.2.1A HOW MANY DATA POINT(S) CHANGES (I)?

Input the number of pairs to be changed. If the number of pairs is greater than half the total number, all of the data must be retyped.

12.2.1B INPUT DATA POINT NUMBER(S) (I)-

Input the I value for each pair that needs to be changed.

12.2.1C INPUT DATA POINT CHANGE (X,Y)-

I=# X,Y=

A do loop is created allowing you to type in the correct X and Y value for each corresponding I value.

[D]

12.2.2A HOW MANY POINTS TO BE DELETED (MAX=#)?

Input the number of data points to be deleted from the array up to the total number minus one.

12.2.2B WHICH POINTS DELETED (IN ASCENDING ORDER)?

Only the integer value of the data point need be input to delete it from the array.

[A]

12.2.3A HOW MANY POINTS TO ADD (MAX=#)?

Input the number of data points to be added up to 30 minus the total number previously input.

12.2.3B INPUT NEW POINT(S) (X1, Y1, X2, Y2,...)-

Input data pairs in the same manner as original input.

12.3 REVIEW DATA (Y OR N)?

[Y] The corrected data will be printed

12.4 IS DATA ACCEPTABLE (Y OR N)?

[N] A negative answer will allow the data to be corrected again.

13. SYMBOLS DRAWN (Y OR N) ?

[N] A curve will be drawn with no symbols. A legend cannot be printed unless the curve has symbols.

[Y]

13.2 INPUT INTEGER VALUE FOR SYMBOL

WHERE 0=SQUARE, 1=CIRCLE, 2=TRIANGLE, 3=+, AND 4=CAPX

13.1 SMOOTH CURVE FIT, LEAST SQUARE FIT, STRAIGHT LINE BETWEEN POINTS OR DATA POINTS ONLY? INPUT SCF, LSF, LBP, OR DPO -

[SCF] The Subroutine SPLINE will be used to connect all of the data points with a curve that is as smooth as possible.

[LSF]

13.2.1 INPUT DEGREE OF LEAST SQUARE POLYNOMIAL (I) (1-6) -

The subroutine PLSCF will be used to calculate the Least Square coefficients, 2, accordingly:

Degree = 1, $f(x) = Z(1) + Z(2)x$
= 2, $f(x) = Z(1) + Z(2)x + Z(3)x^2$
etc.

13.2.2 REVIEW LEAST SQUARE COEFFICIENTS (Y OR N) ?

An affirmative answer will print out the coefficients in F7.4 format.

Z(I) =

13.2.3 REVIEW DATA FOR LEAST SQUARE FIT (Y OR N) ?

After the new Y values have been calculated, the data can be printed out in I2, F15.5 format.

I= X= Y=

[LBP] A straight line will be drawn between each data point connecting all the points.

[DPO] Only the symbols at each data point will be drawn with no connecting curve.

13.3.1 DO YOU WANT A LEGEND ?

[Y]

INPUT MESSAGE FOR SYMBOL #1 -

Any letter/number combination with up to 39 characters can be typed in. The escape characters can be used.

13.3.2 INPUT X AND Y VALUES FOR LOWER LEFT HAND CORNER OF LEGEND

(INS) (F.P.,F.P.) -

Type in the location for the lower left hand corner of the entire legend, in inches from the lower left hand corner of the plotting page, not the X,Y value of the plot. A legend can only be printed when each curve of the plot has a symbol.

[N] According to previous data, program will either ask for data for multiple curves by returning to question #11 or continue with question #15.

14. REVIEW PLOT ?

[N] A negative response will return you to the beginning to create a new plot file, purging the file just created.

[Y] The Statement:

<<< TYPE IN, DRAW =1\$, FOR DISSPLA DIRECTIVES >>>
will appear. This is a necessary command for DISSPLA to
terminate the plot file and Tektronix to display the plot.
User types in "DRAW =1\$" only. After plotting is completed,
hit return key twice and program will return to the
beginning.

15. INPUT DATA FOR NEW CURVE?

If you wish to get a copy from the calcomp plotter, respond negatively.
An affirmative answer will create a new plot file, purging the plot
just viewed.

[N]

16. SAVE FOR CALCOMP PLOTTER ?

[Y] The message:

<<< TYPE IN, DRAW=1\$, FOR DISSPLA DIRECTIVES >>>
appears once again. Type in "DRAW =1\$". The plot has been
saved with bin number AK. The program will now return to the
beginning.

[N] Stop

INPUT DATA FOR NEW CURVE?

[Y] If more plotting is to be done, continue.

[N]

SAVE FOR CALCOMP PLOTTER?

[N] Stop program. "LOGOUT."

[Y] A loop is created, making a copy of your plot then returning back
to the beginning of the program, until a negative response is
entered.

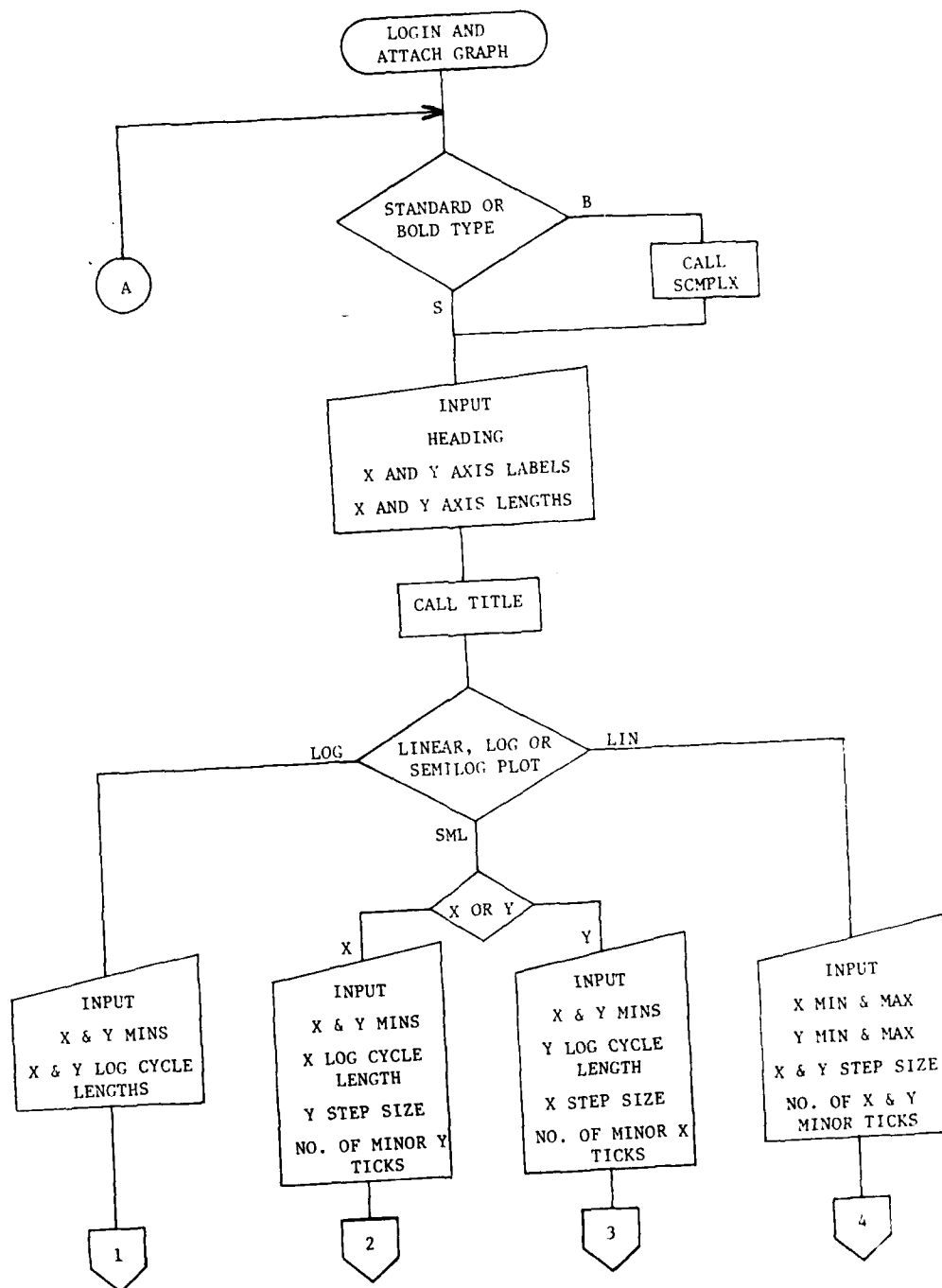
SECTION IV

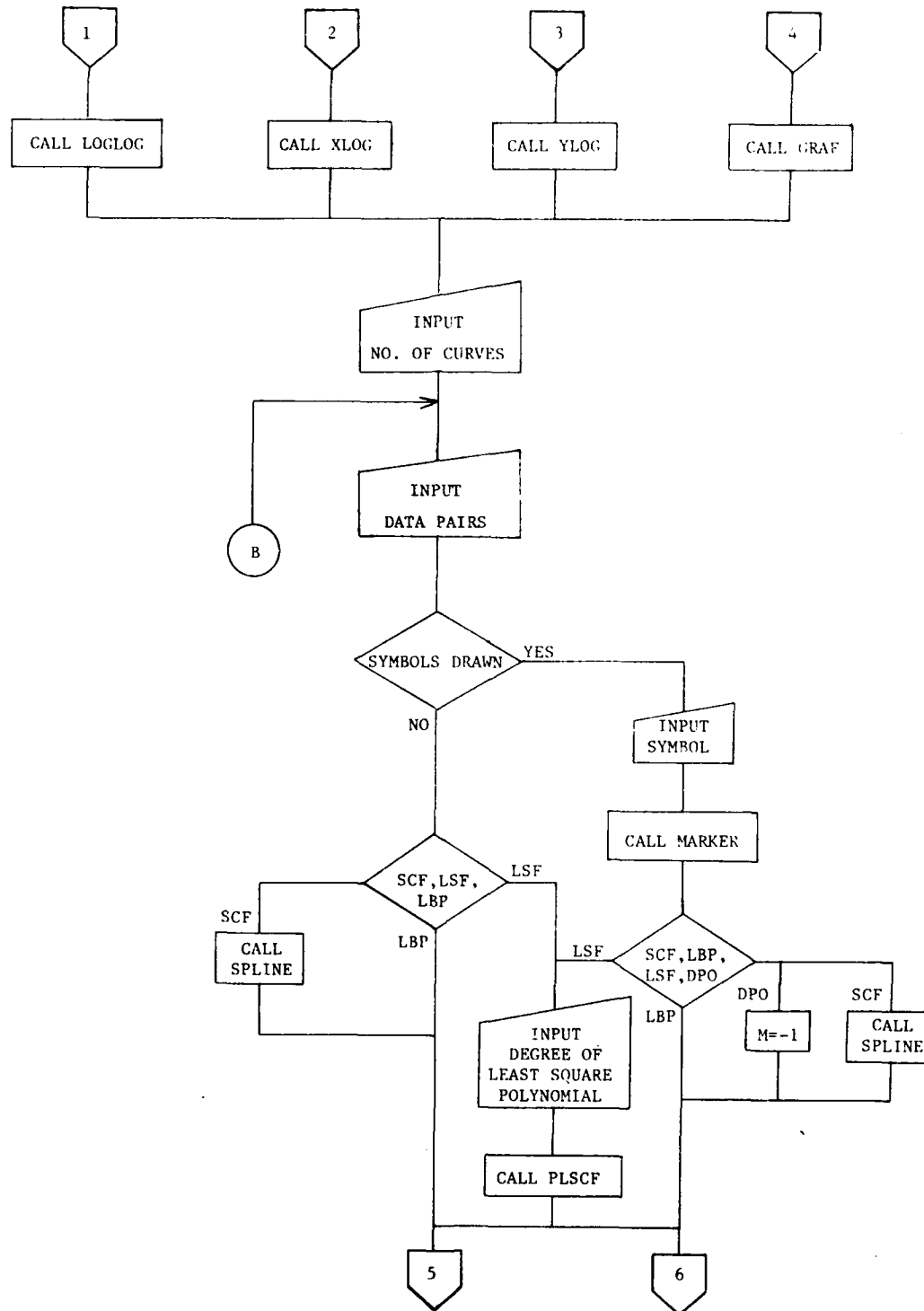
CONCLUSION

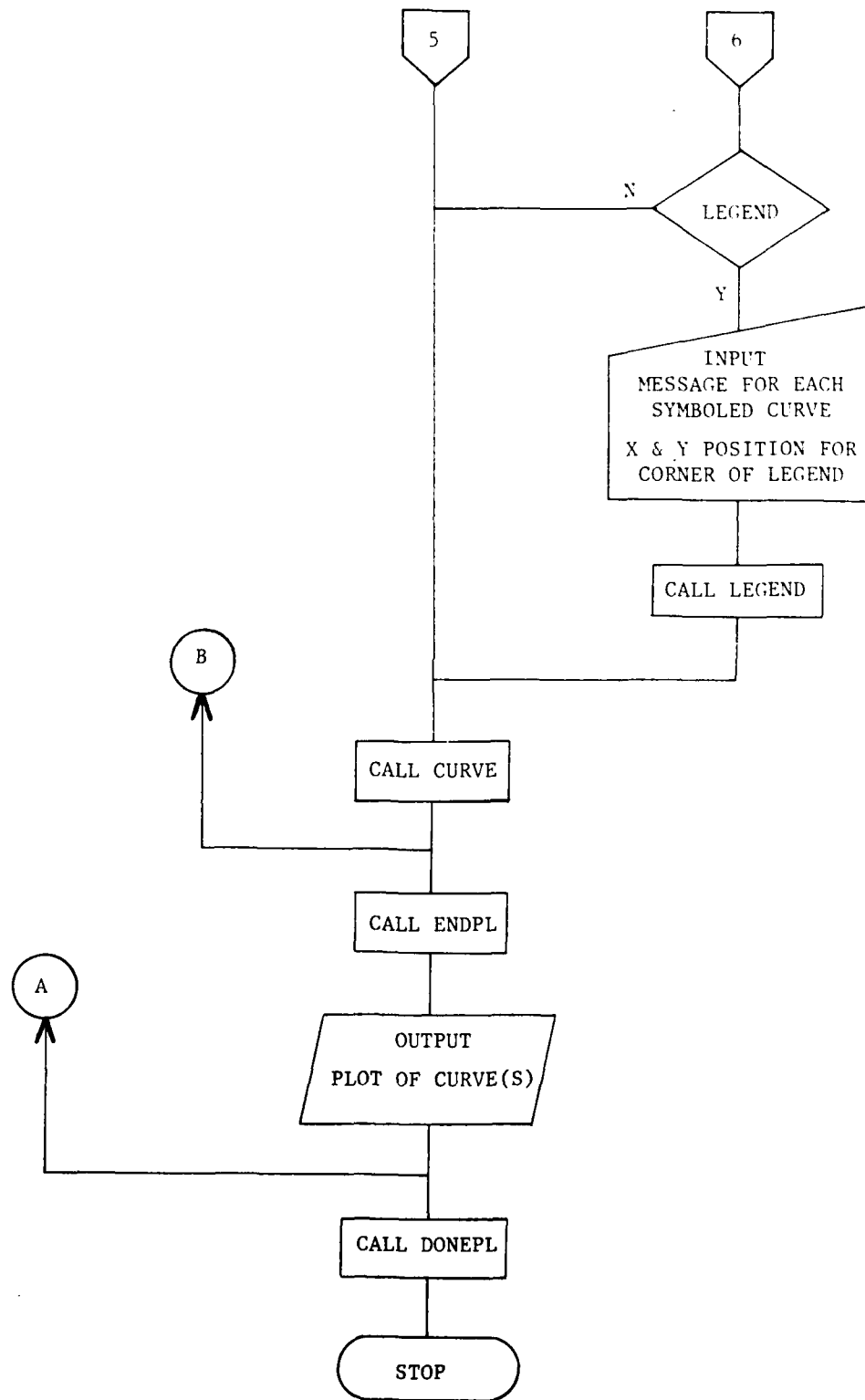
"GRAPH" is a straight forward interactive computer program designed to establish a standard format in plotting analytical data. The program provides a quick and efficient method of preparing a finished plot that is suitable for direct substitution into papers for publication. GRAPH was programed for use on the CDC6600 via a TEK4010 on-line computer terminal.

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APPENDIX A
GRAPH-PROGRAM FLOW CHART







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APPENDIX B
GRAPH- PROGRAM LISTING

PROGRAM PLTJ 7/7/76 DTG: 03/24/80 09:09:22

RTS 4,7,7,7

DTG: 03/24/80

PROGRAM PLTJ

```

PROGRAM PLTJ (COMPJ)
  IMPLICIT REAL*8 (A-H,O)
  IMPLICIT INTEGER*4 (I-N)
  COMMON / DATA / X(1000), Y(1000), Z(1000), W(1000), V(1000)
  COMMON / PARAM / P(1000), Q(1000), R(1000), S(1000), T(1000)
  COMMON / RESULT / U(1000), V(1000), W(1000), X(1000), Y(1000)
  COMMON / CONTROL / Z(1000), A(1000), B(1000), C(1000), D(1000)
  DATA X(1000), Y(1000), Z(1000), W(1000), V(1000)
  DATA P(1000), Q(1000), R(1000), S(1000), T(1000)
  DATA U(1000), V(1000), W(1000), X(1000), Y(1000)
  DATA Z(1000), A(1000), B(1000), C(1000), D(1000)

```

```

CALL COMPJ
  WRITE (6,*)
  FORMAT (10H)

```

```

  X(1000) = 0.0
  Y(1000) = 0.0
  Z(1000) = 0.0
  W(1000) = 0.0
  V(1000) = 0.0

```

```

  CALL COMPJ
  WRITE (6,*)
  FORMAT (10H)

```

```

  CALL COMPJ
  WRITE (6,*)
  FORMAT (10H)

```

```

  CALL COMPJ
  WRITE (6,*)
  FORMAT (10H)

```

```

  CALL COMPJ
  WRITE (6,*)
  FORMAT (10H)

```

```

  CALL COMPJ
  WRITE (6,*)
  FORMAT (10H)

```

```

  CALL COMPJ
  WRITE (6,*)
  FORMAT (10H)

```

23

24

[illegible]

[illegible]

29

76. $2 \times V$ (22, 20, 20, 20)
 77. $2 \times V$ (20, 20, 20, 20)
 78. $2 \times V$ (20, 20, 20, 20)
 79. $2 \times V$ (20, 20, 20, 20)
 80. $2 \times V$ (20, 20, 20, 20)
 81. $2 \times V$ (20, 20, 20, 20)
 82. $2 \times V$ (20, 20, 20, 20)
 83. $2 \times V$ (20, 20, 20, 20)
 84. $2 \times V$ (20, 20, 20, 20)
 85. $2 \times V$ (20, 20, 20, 20)
 86. $2 \times V$ (20, 20, 20, 20)
 87. $2 \times V$ (20, 20, 20, 20)
 88. $2 \times V$ (20, 20, 20, 20)
 89. $2 \times V$ (20, 20, 20, 20)
 90. $2 \times V$ (20, 20, 20, 20)
 91. $2 \times V$ (20, 20, 20, 20)
 92. $2 \times V$ (20, 20, 20, 20)
 93. $2 \times V$ (20, 20, 20, 20)
 94. $2 \times V$ (20, 20, 20, 20)
 95. $2 \times V$ (20, 20, 20, 20)
 96. $2 \times V$ (20, 20, 20, 20)
 97. $2 \times V$ (20, 20, 20, 20)
 98. $2 \times V$ (20, 20, 20, 20)
 99. $2 \times V$ (20, 20, 20, 20)
 100. $2 \times V$ (20, 20, 20, 20)

09.09.22 73/26/53 4.7+4.7, 148/10 122=1

[illegible]

[illegible]

31

[illegible]

903 CALL COMPTON
 904 CALL COMPTON
 905 CALL COMPTON
 906 CALL COMPTON
 907 CALL COMPTON
 908 CALL COMPTON
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 911 CALL COMPTON
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 996 CALL COMPTON
 997 CALL COMPTON
 998 CALL COMPTON
 999 CALL COMPTON
 1000 CALL COMPTON

22.40.4.0 15/06/11

- 1 -

[illegible]

100

100

— 10 —

$$\{ \cdot, \cdot \} = \{ \cdot, \cdot \}$$

(1) 100%

— — — — —

[illegible]

It is not, however, the

2011.10.25

1971-72

[illegible]

11-11-11

—

[illegible]

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APPENDIX C
DISPLA SUBROUTINE DESCRIPTION

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For modifications, a brief description of each subroutine used from DISSPLA follows as they are used in the program. If more information is needed see the DISSPLA manual.

COMPRS sets up the interface between the TEK4010 and DISSPLA.

BGNPL initializes the common blocks of DISSPLA. It will also reset the common blocks to begin a new plot file.

NOBRDR overrides the default option of drawing a rectangular border, framing the plot.

PAGE is used to obtain a page size other than 8 1/2" x 11". In this case an 11" x 11" plotting page is being used so that the title and X label will not be truncated by DISSPLA. Finished plots will fit on a standard 8 1/2" x 11" page if the X axis length does not exceed 7 1/2".

SCMPLX will be called if the user asks for bold writing. This style offers characters suitable for publication.

MXIALF is used to signal mixed alphabets. The "i" has been replaced by an integer to define which escape character is used for each alphabet. DISSPLA allows six alphabets to be used at one time. In this case a semi colon ; is used to reset type to standard. A plus sign + is used for upper case Greek. A slash / is used for lower case Greek. Quotes " are used for upper case Russian. For a superscript @EH.5; should be typed in. For a subscript, type @LH.5; . To reset to standard size and level, type @EXHX; or @LXHX; . If any of the escape characters are used in a label, they should be typed twice.

TITLE is used to define the axes labels and lengths.

CROSS is used to cause the axes to intersect at the 0.,0. point if it exists. If it does not exist, the axes will intersect at the minimum positive value.

YAXANG(0.) will write the Y axis numbering horizontally. The value in parenthesis corresponds to the angle in degrees from the horizontal for which the Y axis will be numbered. DISSPLA has a default angle of 90 degrees.

XTICKS will subdivide each X axis division in the amount requested.

YTICKS will subdivide each Y axis division in the amount requested.

GRAF is used to define the X-Y physical origin, the X and Y step size, and the X and Y maximum value for linear type plots.

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LOGLOG is used to define the X-Y physical origin, and the X and Y log cycle lengths for log-log type plots.

XLOG is used to define the X-Y physical origin, the X log cycle length and the Y step size for semilog type plots.

YLOG is used to define the X-Y physical origin, the Y log cycle length and the X step size for semilog type plots.

MARKER uses the symbol corresponding to the input integer value with a total of 14 different symbols.

LINES is used to define the labels of the symbols for use in the legend and to give DISSPLA the workspace it needs for the legend.

SPLINE interpolation fits third order polynomials between each pair of points so that the curve is continuous everywhere.

RESET will reset any parameter option to the default option.

CURVE is used to plot each curve on the plot.

LEGEND puts a legend on the plot by inputting the location of the lower left hand corner.

ENDPL terminates plotting the current plot file and reinitializes DISSPLA.

DONEPL terminates the current plot file.

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APPENDIX D
GRAPH-PROGRAM EXAMPLE

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EXAMPLE 1

Example 1 illustrates the use of the following options:

- Standard Type
- Linear Plotting
- Multiple Curves
- Symbolled Curves
- Smooth Curve Fit (SCF)
- Least Squares Fit (LSF)
- Straight Line Between Points (LBP)
- Data Points Only (DPO)
- Legend
- Calcomp Reproduction

PLOTTING PROGRAM FOR DISSPLA 4 JAN 1980
 ANSWER QUESTIONS AS EITHER FLOATING PT. (F.P.) VALUES OR AS
 INTEGER (I) VALUES AS INDICATED. ANSWER DEFINITIVE
 QUESTIONS WITH EITHER Y FOR YES OR N FOR NO
 INPUT DATA FOR NEW CURVE (Y OR N) ?Y

PLOTTING COMMENCING

..... DISSPLA VERSION 7.2
 NO. OF FIRST PLOT 1

DO YOU WANT STANDARD OR BOLD TYPE ? INPUT S OR B -S
 INPUT THE FOLLOWING SYMBOLS TO GET THE CORRESPONDING TYPE LETTERING-
 ? = LOWER CASE STANDARD
 + = UPPER CASE GREEK
 / = LOWER CASE GREEK
 @EH.5; = SUPERSCRIPT
 @LH.5; = SUBSCRIPT
 EITHER @EXHX; OR @LXHX; TO RESET BACK TO STANDARD SIZE
 ; = RESETS TO STANDARD LETTERING
 ARE YOU USING THE SPECIAL ALPHABETS (Y OR N) ?N

INPUT HEADING (MAX 45 CHARACTERS) -
EXAMPLE PLOT WITH MULTIPLE CURVES

LABEL FOR X-AXIS (MAX 59 CHARACTERS) -
X-AXIS

LABEL FOR Y-AXIS (MAX 59 CHARACTERS) -
Y-AXIS

INPUT X-AXIS LENGTH (MAX=8.5 INS) (F.P.) -6.

INPUT Y-AXIS LENGTH (MAX=9.5 INS) (F.P.) -6.

IS THIS A LINEAR, LOG, OR SEMILOG PLOT?
INPUT LIN, LOG, OR SML -LIN

```

INPUT XMIN AND XMAX VALUE (F.P.,F.P.) -0.,6.
INPUT YMIN AND YMAX VALUE (F.P.,F.P.) -0.,18.
INPUT X STEP SIZE (Y OR N) ?N
INPUT Y STEP SIZE (Y OR N) ?Y
Y STEP SIZE (UNITS/DIV.) (F.P.) =3.
INPUT THE NO. OF MINOR TICKS PER Y DIV. (I) -3
HOW MANY CURVES PER PLOT (MAX=5) (I) ?4
INPUT DATA FOR CURVE # 1 (X1,Y1,X2,Y2,...END WITH /) -
0.,0.,1.,1.,2.,4.,3.,9.,4.,13.,5.,15.,6.,17./
REVIEW DATA (Y OR N) ?Y

```

0.00000
1.00000
4.00000
9.00000
13.00000
15.00000
17.00000

Y=
Y=
Y=
Y=
Y=
Y=
Y=

0.00000
1.00000
2.00000
3.00000
4.00000
5.00000
6.00000

X=
X=
X=
X=
X=
X=
X=

1
2
3
4
5
6
7

I=
I=
I=
I=
I=
I=
I=

IS DATA ACCEPTABLE (Y OR N) ? Y

SYMBOLS DRAWN (Y OR N) ?Y

INPUT INTEGER VALUE FOR SYMBOL

WHERE 0=SQUARE, 1=CIRCLE, 2=TRIANGLE, 3=+, 4=CAP X -0

SMOOTH CURVE FIT, LEAST SQUARE FIT, STRAIGHT LINE BETWEEN POINTS,
OR DATA POINTS ONLY? INPUT SCF,LSF,LBP,OR DPO -SCF

DO YOU WANT A LEGEND (Y OR N) ?Y

INPUT MESSAGE FOR CURVE #1 (MAX 39 CHARACTERS) -
SMOOTH CURVE FIT

INPUT DATA FOR CURVE # 2 (X1,Y1,X2,Y2,...END WITH /) -
15.35,5.55,1.15,7.1,25.1,1.1,6.1,3,2,2,1.9,2.6,2.15,2.55,2.3,2.8,2.6,
2.75,2.85,2.95,3.1,4.3,35,5.3,5.5,5.4,6,4.5,6.5,5.5,10./

REVIEW DATA (Y OR N) ?Y

I=1	X=X	15000	Y=	35000
I=2	X=X	50000	Y=	55000
I=3	X=X	1.15000	Y=	70000
I=4	X=X	1.25000	Y=	1.10000
I=5	X=X	1.60000	Y=	1.30000
I=6	X=X	2.20000	Y=	1.90000
I=7	X=X	2.55000	Y=	2.30000
I=8	X=X	2.60000	Y=	2.15000
I=9	X=X	2.75000	Y=	2.85000
I=10	X=X	2.80000	Y=	2.60000
I=11	X=X	2.95000	Y=	3.10000
I=12	X=X	4.00000	Y=	3.35000
I=13	X=X	5.00000	Y=	3.50000
I=14	X=X	5.50000	Y=	4.00000
I=15	X=X	6.00000	Y=	4.50000
I=16	X=X	6.50000	Y=	5.50000
I=17	X=X	10.00000	Y=*****	*****

IS DATA ACCEPTABLE (Y OR N) ?N

DO YOU WISH TO DELETE, ADD, OR CHANGE POINTS (D, A, OR C) ? C

HOW MANY DATA POINT(S) CHANGES (I) ? 16

INPUT DATA FOR CURVE # 2 (X1,Y1,X2,Y2,...END WITH /) -
 15.35,4,5,55,1.15,7,1.25,1.1,1.8,1.3,2.2,1.9,2.6,2.15,2.55,2.3,
 2.8,2.6,2.75,2.85,2.95,3.1,4,3.35,5,3.5,5.5,4,6,4.5,6.5,5,7,5.5,10, /

REVIEW DATA (Y OR N) ? Y

I=1	X=	15000	Y=	35000
I=2	X=	40000	Y=	50000
I=3	X=	55000	Y=	1.15000
I=4	X=	70000	Y=	1.25000
I=5	X=	1.10000	Y=	1.80000
I=6	X=	1.30000	Y=	2.20000
I=7	X=	1.90000	Y=	2.60000
I=8	X=	2.15000	Y=	2.55000
I=9	X=	2.30000	Y=	2.80000
I=10	X=	2.60000	Y=	2.75000
I=11	X=	2.85000	Y=	2.35000
I=12	X=	3.10000	Y=	4.00000
I=13	X=	3.35000	Y=	5.00000
I=14	X=	3.50000	Y=	5.50000
I=15	X=	4.00000	Y=	6.00000
I=16	X=	4.50000	Y=	6.50000
I=17	X=	5.00000	Y=	7.00000
I=18	X=	5.50000	Y=	10.00000

IS DATA ACCEPTABLE (Y OR N) ? Y

SYMBOLS DRAWN (Y OR N) ? Y
 INPUT INTEGER VALUE FOR SYMBOL
 WHERE 0=SQUARE, 1=CIRCLE, 2=TRIANGLE, 3=+, 4=CAP X - 1
 SMOOTH CURVE FIT, LEAST SQUARE FIT, STRAIGHT LINE BETWEEN POINTS,
 OR DATA POINTS ONLY? INPUT SCF, LSF, LBP, OR DPO - LSF
 INPUT DEGREE OF LEAST SQUARE POLYNOMIAL (1) (1-6) - 1
 REVIEW LEAST SQUARE COEFFICIENTS (Y OR N) ? Y
 Z(1) = -.2344
 Z(2) = 1.5377
 REVIEW DATA FOR LEAST SQUARE FIT (Y OR N) ? N

DO YOU WANT A LEGEND (Y OR N) ?Y

INPUT MESSAGE FOR CURVE #2 (MAX 39 CHARACTERS) -
LEAST SQUARE FIT

INPUT DATA FOR CURVE # 3 (X1,Y1,X2,Y2,...END WITH /) -
1.,17.,3.,11.,6.,9./

REVIEW DATA (Y OR N) ?Y

I= 1	X=	1.00000	Y=	17.00000
I= 2	X=	3.00000	Y=	11.00000
I= 3	X=	6.00000	Y=	9.00000
IS DATA ACCEPTABLE (Y OR N) ?N				

DO YOU WISH TO DELETE, ADD, OR CHANGE POINTS (D, A, OR C) ?A

HOW MANY POINTS TO ADD (MAX= 27) ?2

INPUT NEW POINT(S) (X1,Y1,X2,Y2,...) -
1.,17.,2.,13.

REVIEW DATA (Y OR N) ?Y

I=	1	X=	1.00000	Y=	17.00000
I=	2	X=	1.00000	Y=	17.00000
I=	3	X=	2.00000	Y=	13.00000
I=	4	X=	3.00000	Y=	11.00000
I=	5	X=	6.00000	Y=	9.00000
IS DATA ACCEPTABLE (Y OR N) ?Y					

```

SYMBOLS DRAWN (Y OR N) ?Y
INPUT INTEGER VALUE FOR SYMBOL
WHERE 0=SQUARE, 1=CIRCLE, 2=TRIANGLE, 3=+, 4=CAP X -2
SMOOTH CURVE FIT, LEAST SQUARE FIT, STRAIGHT LINE BETWEEN POINTS,
OR DATA POINTS ONLY? INPUT SCF,LSF,LBP,OR DPO -LBP
DO YOU WANT A LEGEND (Y OR N) ?Y
INPUT MESSAGE FOR CURVE #3 (MAX 39 CHARACTERS) -
LINE BETWEEN POINTS
INPUT DATA FOR CURVE # 4 (X1,Y1,X2,Y2,...END WITH /) -
0.,4.,.5,8.,1.,12.,1.25,13.,1.5,16./
REVIEW DATA (Y OR N) ?Y

```


I=1	X=	0.00000	Y=	4.00000
I=2	X=	.50000	Y=	8.00000
I=3	X=	1.00000	Y=	12.00000
I=4	X=	1.25000	Y=	13.00000
I=5	X=	1.50000	Y=	16.00000

IS DATA ACCEPTABLE (Y OR N) ?N

DO YOU WISH TO DELETE, ADD, OR CHANGE POINTS (D, A, OR C) ?D

HOW MANY POINTS TO BE DELETED (MAX= 4) ?1

WHICH POINT(S) DELETED (IN ASCENDING ORDER) ?

REVIEW DATA (Y OR N) ?Y

I= 1	X=	0.00000	Y=	4.00000
I= 2	X=	.50000	Y=	8.00000
I= 3	X=	1.00000	Y=	12.00000
I= 4	X=	1.50000	Y=	16.00000

IS DATA ACCEPTABLE (Y OR N) ? Y

SYMBOLS DRAWN (Y OR N) ? Y

INPUT INTEGER VALUE FOR SYMBOL
WHERE 0=SQUARE, 1=CIRCLE, 2=TRIANGLE, 3=+, 4=CAP X - 3

SMOOTH CURVE FIT, LEAST SQUARE FIT, STRAIGHT LINE BETWEEN POINTS,
OR DATA POINTS ONLY? INPUT SCF, LSF, LBP, OR DPO - DPO

DO YOU WANT A LEGEND (Y OR N) ? Y

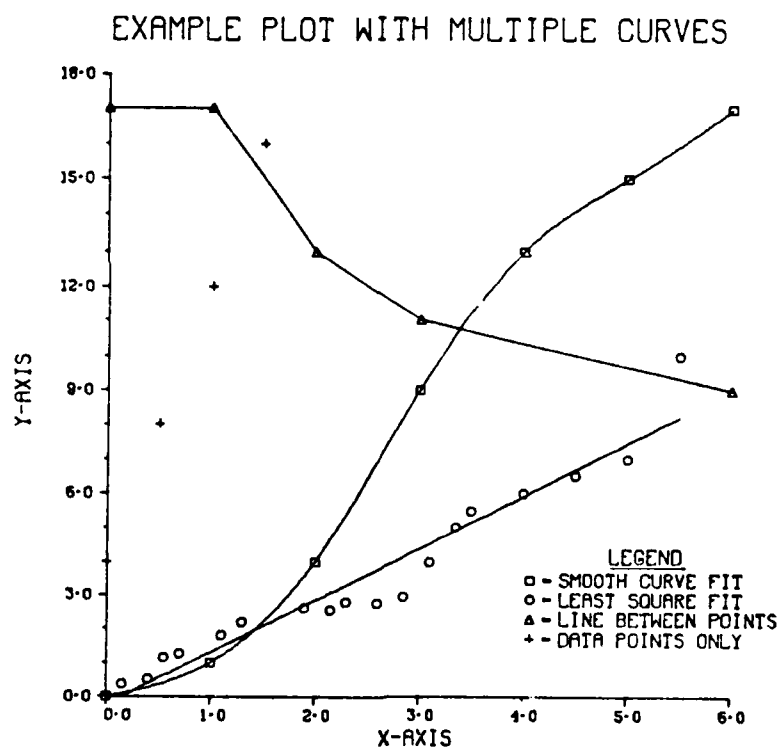
INPUT MESSAGE FOR SYMBOL #4 (MAX 39 CHARACTERS) -
DATA POINTS ONLY

INPUT X AND Y VALUES
FOR LOWER LEFT HAND CORNER OF LEGEND (INS.) (F.P., F.P.) - 4., .5

REVIEW PLOT (Y OR N) ? Y

<<<< TYPE IN," DRAW=1\$ ", FOR DISSPLA DIRECTIVES >>>>

DISSPLA POSTPROCESSOR FOR TEKTRONIX 4010 TERMINAL.
ENTER DIRECTIVES.
END CARD
1.434 CP SECONDS EXECUTION TIME
1994 DISSPLA VECTORS GENERATED.
END OF DISSPLA PLOT GENERATION.
PFM IS
DISSPLA:
PF CYCLE NO. = 001DRAW=1\$



PLOTTING PROGRAM FOR DISSPLA 4 JAN 1980
ANSWER QUESTIONS AS EITHER FLOATING PT. (F.P.) VALUES OR AS
INTEGER (I) VALUES AS INDICATED. ANSWER DEFINITIVE
QUESTIONS WITH EITHER Y FOR YES OR N FOR NO

INPUT DATA FOR NEW CURVE (Y OR N) ?
END TEK4010 N

SAVE FOR CALCOMP PLOTTER (Y OR N) ?Y

<<<< TYPE IN," DRAW=1\$ ", FOR DISSPLA DIRECTIVES >>>>

DISSPLA POSTPROCESSOR FOR 1038 CALCOMP PLOTTER.
READING DIRECTIVES.

END PLTD

.035 CP SECONDS EXECUTION TIME

PFN IS

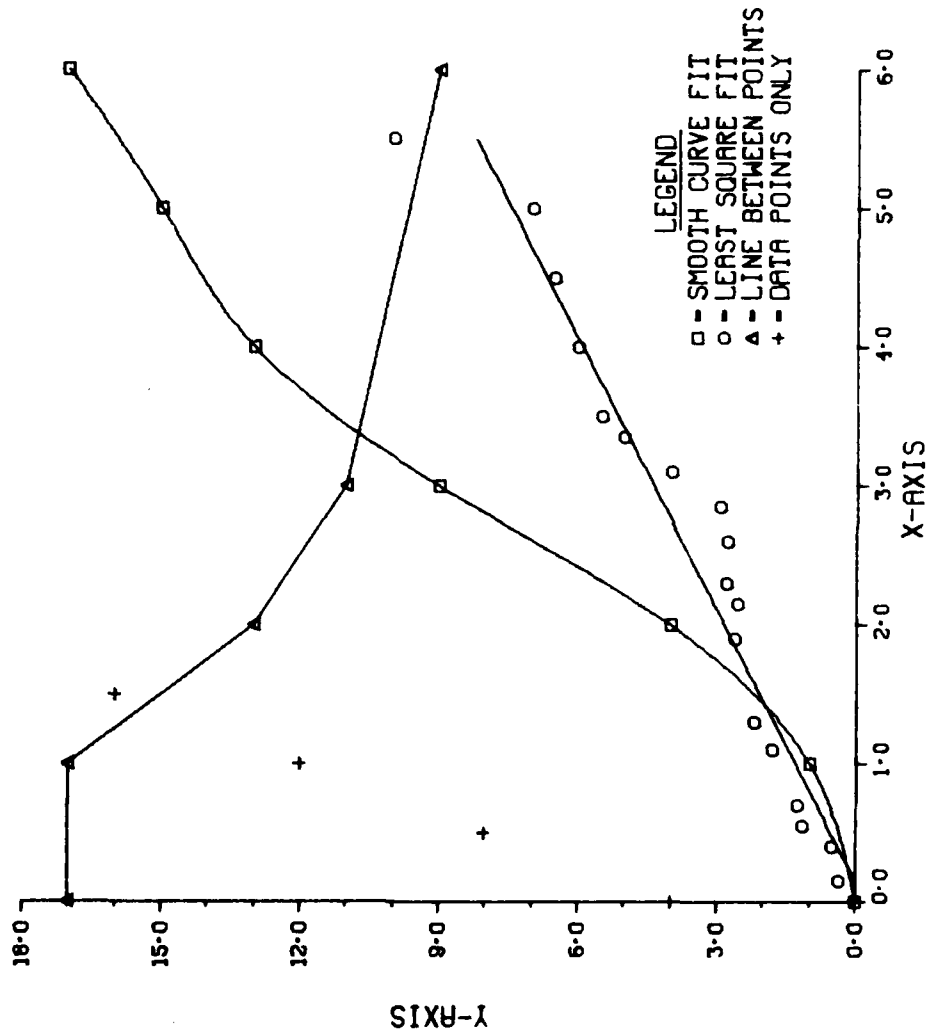
DISSPLA:

PFN IS

PLT1038:

PF CYCLE NO. = 001DRAW=1\$

EXAMPLE PLOT WITH MULTIPLE CURVES



EXAMPLE 2

Example 2 illustrates the use of the following options:

- Bold Type
- Lower Case Greek Lettering
- Logarithmic Plotting
- Smooth Curve Fit (SCF)
- Calcomp Reproduction

PLOTTING PROGRAM FOR DISSPLA 4 JAN 1980
ANSWER QUESTIONS AS EITHER FLOATING PT. <F.P.> VALUES OR AS
INTEGER <I> VALUES AS INDICATED. ANSWER DEFINITIVE
QUESTIONS WITH EITHER Y FOR YES OR N FOR NO.

INPUT DATA FOR NEW CURVE <Y OR N> ?Y

PLOTTING COMMENCING

DISSPLA VERSION 7.2
NO. OF FIRST PLOT 1

DO YOU WANT STANDARD OR BOLD TYPE ? INPUT S OR B -B

INPUT THE FOLLOWING SYMBOLS TO GET THE CORRESPONDING TYPE LETTERING--

? = LOWER CASE STANDARD

+ = UPPER CASE GREEK

/ = LOWER CASE GREEK

@EH.5; = SUPERSCRIPT

@LH.5; = SUBSCRIPT

EITHER @EXHX; OR @LXHX; TO RESET BACK TO STANDARD SIZE

; = RESETS TO STANDARD LETTERING

ARE YOU USING THE SPECIAL ALPHABETS <Y OR N> ?Y

```
INPUT HEADING <MAX 45 CHARACTERS> -  
EXAMPLE LOG PLOT  
  
LABEL FOR X-AXIS <MAX 59 CHARACTERS> -  
X <"/M;INS.>  
  
LABEL FOR Y-AXIS <MAX 59 CHARACTERS> -  
Y <INS.>  
  
INPUT X-AXIS LENGTH <MAX=8.5 INS> <F.P.> - 6.  
INPUT Y-AXIS LENGTH <MAX=9.5 INS> <F.P.> - 6.  
  
IS THIS A LINEAR, LOG, OR SEMILOG PLOT?  
INPUT LIN, LOG, OR SML -  
BEGIN DISSPLA PLOT GENERATION      LOG
```

INPUT THE MIN X AND Y VALUES >0. (F.P.,F.P.) - 1.,1.
 INPUT X AND Y LOG CYCLE LENGTHS .NE. 0. (INS./CYCLE) (F.P.,F.P.) - 2 ,
 HOW MANY CURVES PER PLOT (MAX=5) (I) ? 1
 HOW MANY PAIRS OF DATA, CURVE #1 (I) ? 7
 INPUT DATA (X1,Y1,X2,Y2,...) -
 1.1,5,4,10,9,50,16,100,36,500,100,1000,1000
 REVIEW DATA (Y OR N) ? Y

I=	1	X=	1.00000	Y=	1.00000
I=	2	X=	5.00000	Y=	4.00000
I=	3	X=	10.00000	Y=	9.00000
I=	4	X=	50.00000	Y=	16.00000
I=	5	X=	100.00000	Y=	36.00000
I=	6	X=	500.00000	Y=	100.00000
I=	7	X=	1000.00000	Y=	1000.00000

IS DATA ACCEPTABLE (Y OR N) ? Y

SYMBOLS DRAWN (Y OR N) ?H

SMOOTH CURVE FIT, OR STRAIGHT LINE BETWEEN POINTS ?
INPUT SCF OR LEP - SCF

REVIEW PLOT (Y OR N) ? Y

\$\$\$ TYPE IN." DRAW=1\$ ", FOR DISSPLA DIRECTIVES >>>>

END PLTD

.740 CP SECONDS EXECUTION TIME

713 DISSPLA VECTORS GENERATED.

END OF DISSPLA PLOT GENERATION.

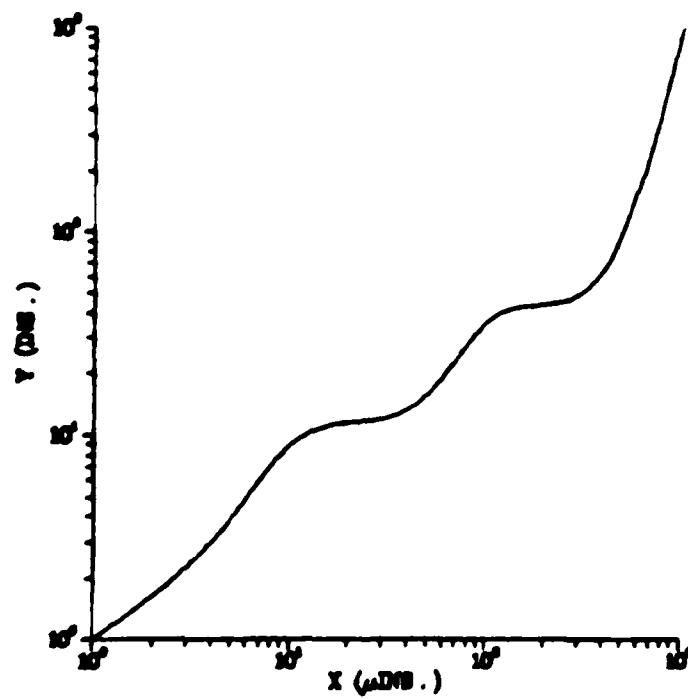
PFN IS

DISSPLA:

DISSPLA POSTPROCESSOR FOR TEKTRONIX 4010 TERMINAL.

ENTER DIRECTIVES. DRAW=1\$

EXAMPLE LOG PLOT



PLOTTING PROGRAM FOR DISSPLA 4 JAN 1980
ANSWER QUESTIONS AS EITHER FLOATING PT. (F.P.) VALUES OR AS
INTEGER (I) VALUES AS INDICATED. ANSWER DEFINITIVE
QUESTIONS WITH EITHER Y FOR YES OR N FOR NO.

INPUT DATA FOR NEW CURVE (Y OR N) ?
END TEK4010 N

SAVE FOR CALCOMP PLOTTER (Y OR N) ?Y

<<< TYPE IN," DRAW=1\$ ", FOR DISSPLA DIRECTIVES >>>>

DISSPLA POSTPROCESSOR FOR 1030 CALCOMP PLOTTER.
READING DIRECTIVES.

END PLTD

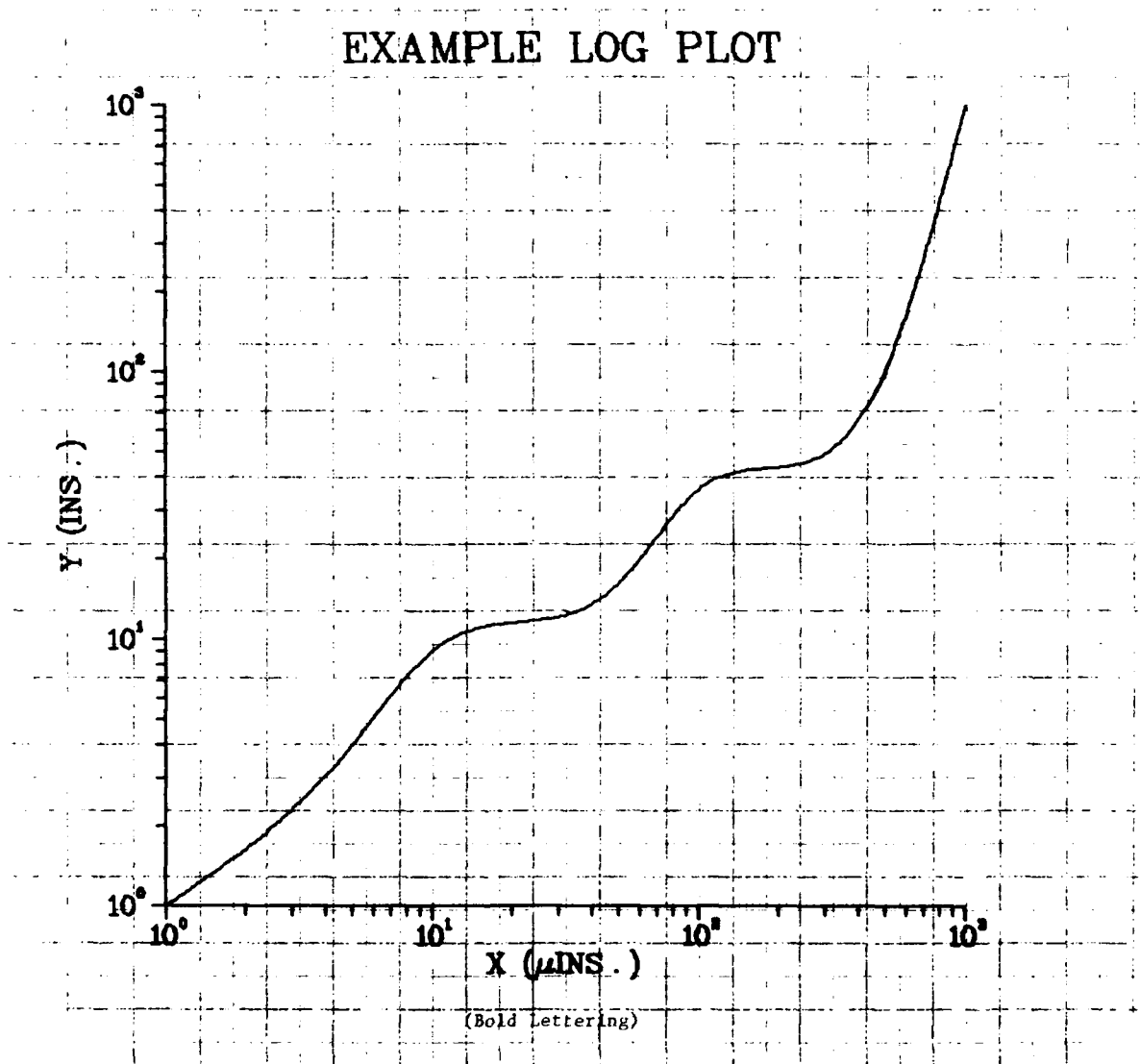
PFM IS .035 CP SECONDS EXECUTION TIME

DISSPLA:

PFM IS

PLT1030:

PF CYCLE NO. = 001DRAW=1\$



EXAMPLE 3

Example 3 illustrates the use of the following options:

- Standard Type
- Lower Case Standard Lettering
- Superscript Numbering
- X-Semilogarithmic Plotting
- Smooth Curve Fit (SCF)
- Calcomp Reproduction

PLOTTING PROGRAM FOR DISSPLA 4 JAN 1980
 ANSWER QUESTIONS AS EITHER FLOATING PT. (F.P.) VALUES OR AS
 INTEGER (I) VALUES AS INDICATED. ANSWER DEFINITIVE
 QUESTIONS WITH EITHER Y FOR YES OR N FOR NO
 INPUT DATA FOR NEW CURVE (Y OR N) ?Y

PLOTTING COMMENCING

DISSPLA VERSION 7.2
 NO. OF FIRST PLOT 1

DO YOU WANT STANDARD OR BOLD TYPE ? INPUT S OR B -S
 INPUT THE FOLLOWING SYMBOLS TO GET THE CORRESPONDING TYPE LETTERING-
 ? = LOWER CASE STANDARD
 + = UPPER CASE STANDARD
 / = LOWER CASE GREEK
 @EH.5; = SUPERScript
 @LH.5; = SUBScript
 EITHER @EXHX; OR @LXHX; TO RESET BACK TO STANDARD SIZE
 , = RESETS TO STANDARD LETTERING
 ARE YOU USING THE SPECIAL ALPHABETS (Y OR N) ?Y

```

INPUT HEADING (MAX 45 CHARACTERS) -
EXAMPLE SEMILOG PLOT

LABEL FOR X-AXIS (MAX 59 CHARACTERS) -
X-AXIS;

LABEL FOR Y-AXIS (MAX 59 CHARACTERS) -
Y-AXIS;20EXHX;

INPUT X-AXIS LENGTH (MAX=8.5 INS) (F.P.) - 6.
INPUT Y-AXIS LENGTH (MAX=9.5 INS) (F.P.) - 6.

IS THIS A LINEAR, LOG, OR SEMILOG PLOT?
INPUT LIN, LOG, OR SML -
BEGIN DISSPLA PLOT GENERATION      SML

```

```

IS PLOT LOG IN X OR LOG IN Y ? INPUT X OR Y -X
INPUT THE MIN X VALUE >0. <F.P.> -1.
INPUT THE MIN Y VALUE <F.P.> -0.
INPUT X LOG CYCLE LENGTH .NE. 0. <INS./CYCLE> <F.P.> -2.
INPUT Y STEP SIZE <UNITS/INCH> <F.P.> -10.
INPUT THE NO. OF MINOR TICKS PER Y DIV. <I> -5
HOW MANY CURVES PER PLOT <MAX=5> <I> ?1
INPUT DATA FOR CURVE # 1 <X1,Y1,X2,Y2,...END WITH /> -
1..1..5..10..12..50..18..100..26..500..36..1000..49./
REVIEW DATA <Y OR N> ?Y

```

I= 1	X=	1.00000	Y=	1.00000
I= 2	X=	5.00000	Y=	5.00000
I= 3	X=	10.00000	Y=	12.00000
I= 4	X=	50.00000	Y=	18.00000
I= 5	X=	100.00000	Y=	26.00000
I= 6	X=	50.00000	Y=	36.00000
I= 7	X=	100.00000	Y=	49.00000

IS DATA ACCEPTABLE (Y OR N) ? N

DO YOU WISH TO DELETE, ADD, OR CHANGE POINTS (D, A, OR C) ? C

HOW MANY DATA POINT(S) CHANGES (I) ? 1

INPUT DATA POINT NUMBER(S) (I) -2

INPUT DATA POINT CHANGE (X,Y)

I= 2 X,Y=5.,6.

REVIEW DATA (Y OR N) ? Y

1.00000
6.00000
12.00000
18.00000
26.00000
36.00000
49.00000

Y=
Y=
Y=
Y=
Y=
Y=
Y=

1.00000
5.00000
10.00000
50.00000
100.00000
500.00000
1000.00000

X=
X=
X=
X=
X=
X=
X=

I=1
I=2
I=3
I=4
I=5
I=6
I=7

IS DATA ACCEPTABLE (Y OR N) ? Y

```

SYMBOLS DRAWN (Y OR N) ?N
SMOOTH CURVE FIT, OR STRAIGHT LINE BETWEEN POINTS ?
INPUT SCF OR LBP -SCF

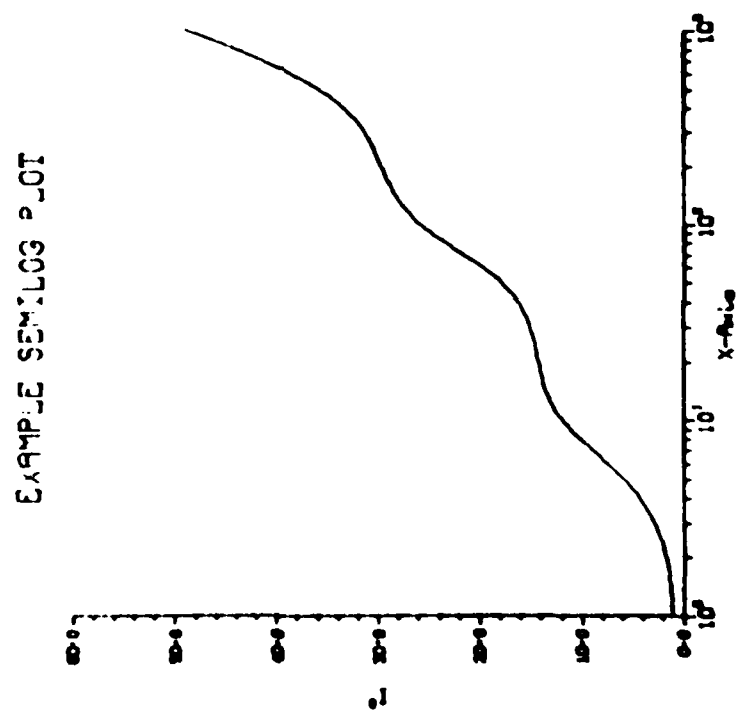
END DISSPLA --      834 VECTORS GENERATED IN      1 PLOT FRAMES.

REVIEW PLOT (Y OR N) ?Y

<<<< TYPE IN," DRAW=1$ ", FOR DISSPLA DIRECTIVES >>>>

DISSPLA POSTPROCESSOR FOR TEKTRONIX 4010 TERMINAL.
ENTER DIRECTIVES.
END PLTD
.465 CP SECONDS EXECUTION TIME
PFN IS
DISSPLA: DRAW=1$

```



PLOTTING PROGRAM FOR DISSPLA 4 JAN 1980
ANSWER QUESTIONS AS EITHER FLOATING PT. (F.P.) VALUES OR AS
INTEGER (I) VALUES AS INDICATED. ANSWER DEFINITIVE
QUESTIONS WITH EITHER Y FOR YES OR N FOR NO.

INPUT DATA FOR NEW CURVE (Y OR N) ?
END TEK4010 N

SAVE FOR CALCOMP PLOTTER (Y OR N) ?Y

<<<< TYPE IN." DRAW=1\$ ", FOR DISSPLA DIRECTIVES >>>>

DISSPLA POSTPROCESSOR FOR 1038 CALCOMP PLOTTER.
READING DIRECTIVES.

END PLTD

.035 CP SECONDS EXECUTION TIME

PFN IS

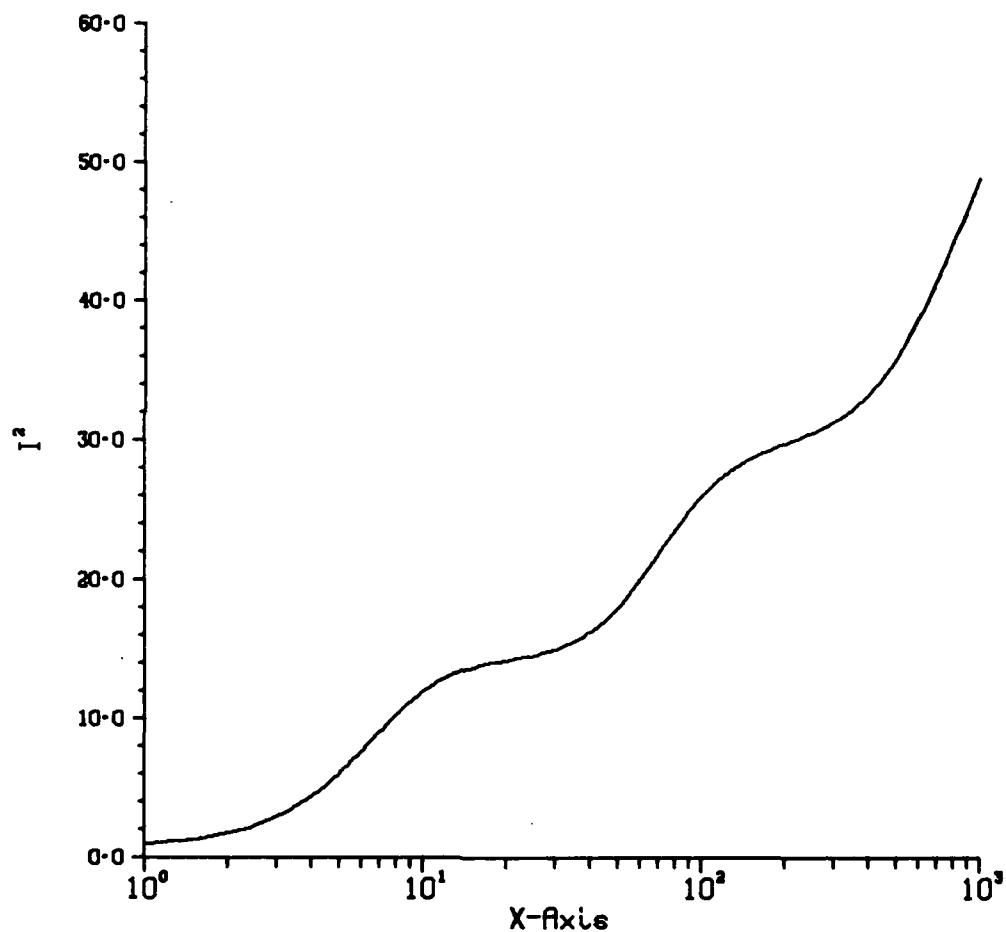
DISSPLA:

PFN IS

PLT1038:

PF CYCLE NO. = 001DRAW=1\$

EXAMPLE SEMILOG PLOT



(Standard Lettering)

EXAMPLE 4

Example 4 illustrates the use of the following options:

- Bold Type
- Russian Lettering
- Y-Semilogarithmic Plotting
- Smooth Curve Fit (SCF)
- Calcomp Reproduction

PLOTTING PROGRAM FOR DISSPLA 4 JAN 1980
ANSWER QUESTIONS AS EITHER FLOATING PT. (F.P.) VALUES OR AS
INTEGER (I) VALUES AS INDICATED. ANSWER DEFINITIVE
QUESTIONS WITH EITHER Y FOR YES OR N FOR NO .

INPUT DATA FOR NEW CURVE (Y OR N) ?Y

PLOTTING COMMENCING

.....

DISSPLA VERSION 7.2
NO. OF FIRST PLOT 1

DO YOU WANT STANDARD OR BOLD TYPE ? INPUT S OR B -B

INPUT THE FOLLOWING SYMBOLS TO GET THE CORRESPONDING TYPE LETTERING-

? = LOWER CASE STANDARD

+ = UPPER CASE GREEK

/ = LOWER CASE GREEK

@EH.5; = SUPERScript

@LH.5; = SUBScript

EITHER @EXHX; OR @LXHX; TO RESET BACK TO STANDARD SIZE

; = RESETS TO STANDARD LETTERING

ARE YOU USING THE SPECIAL ALPHABETS (Y OR N) ?Y

INPUT HEADING <MAX 45 CHARACTERS> -
Y SEMILOG PLOT

LABEL FOR X-AXIS <MAX 59 CHARACTERS> -
X <"0:INS>

LABEL FOR Y-AXIS <MAX 59 CHARACTERS> -
Y-AXIS

INPUT X-AXIS LENGTH <MAX=8.5 INS> <F.P.> -6.

INPUT Y-AXIS LENGTH <MAX=9.5 INS> <F.P.> -6.

IS THIS A LINEAR, LOG, OR SEMILOG PLOT?
INPUT LIN, LOG, OR SML -SML

```

IS PLOT LOG IN X OR LOG IN Y ? INPUT X OR Y -Y
INPUT THE MIN X VALUE (F.P.) -0.
INPUT THE MIN Y VALUE >0. (F.P.) -1.
INPUT Y LOG CYCLE LENGTH .NE. 0. (INS./CYCLE) (F.P.) -2.
INPUT X STEP SIZE (UNITS/INCH) (F.P.) -1.
INPUT THE NO. OF MINOR TICKS PER X DIV. (I) -0
HOW MANY CURVES PER PLOT (MAX=5) (I) ?1
INPUT DATA FOR CURVE # 1 (X1,Y1,X2,Y2,...END WITH /) -
0.,1.,2.,10.,3.,15.,4.,100.,5.,250.,6.,1000.,6.25,400./
REVIEW DATA (Y OR N) ?Y

```

IS DATA ACCEPTABLE (Y OR N) ? H

DO YOU WISH TO DELETE, ADD, OR CHANGE POINTS (D, A, OR C) ?C

HOW MANY DATA POINT(S) CHANGES (I) ? 5

```

INPUT DATA FOR CURVE # 1 (X1,Y1,X2,Y2,... END WITH /)
0.,1.,1.,15.,2.,50.,3.,125.,4.,250.,5.,500.,6.,1000./

```

REVIEW DATA (Y OR N) ?Y

1.00000
15.00000
50.00000
125.00000
250.00000
500.00000
1000.00000

Y=
Y=
Y=
Y=
Y=
Y=
Y=

0.00000
1.00000
2.00000
3.00000
4.00000
5.00000
6.00000

X=
X=
X=
X=
X=
X=
X=

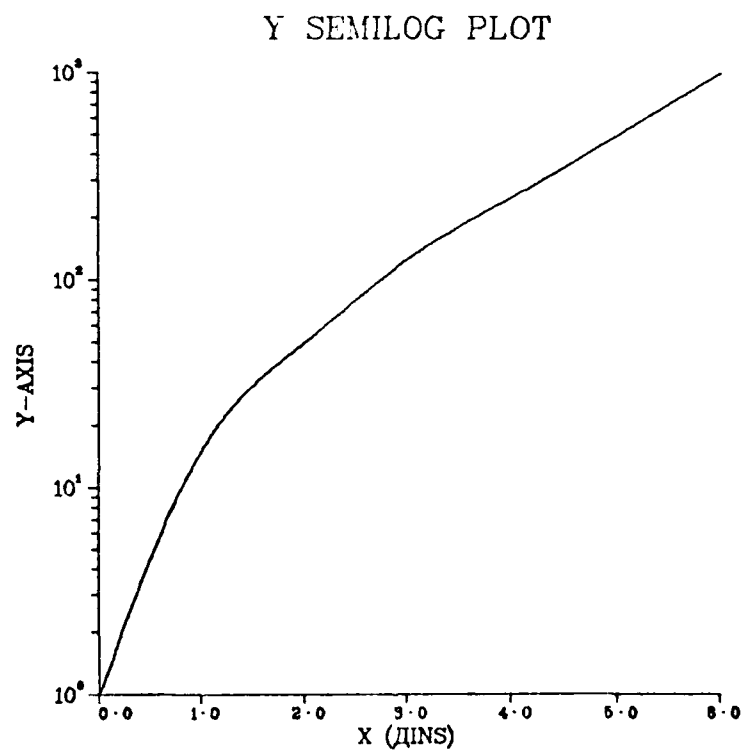
I=1
I=2
I=3
I=4
I=5
I=6
I=7

IS DATA ACCEPTABLE (Y OR N) ? Y


```

SYMBOLS DRAWN (Y OR N) ? N
SMOOTH CURVE FIT, OR STRAIGHT LINE BETWEEN POINTS ?
INPUT SCF OR LBP - SCF
REVIEW PLOT (Y OR N) ? Y
    <<<< TYPE IN." DRAW=1$ ", FOR DISSPLA DIRECTIVES >>>>
END FLTD
    740 CP SECONDS EXECUTION TIME
    718 DISSPLA VECTORS GENERATED.
END OF DISSPLA PLOT GENERATION.
PER IS
DISSPLA:
DISSPLA POSTPROCESSOR FOR TEKTRONIX 4010 TERMINAL.
ENTER DIRECTIVES DRAW=1$

```



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GRAPH-AN INTERACTIVE COMPUTER PROGRAM USED FOR TECHNICAL PLOTTING-ETC (U)
APR 80 S K DRAKE
AFAPL-TR-78-90

UNCLASSIFIED

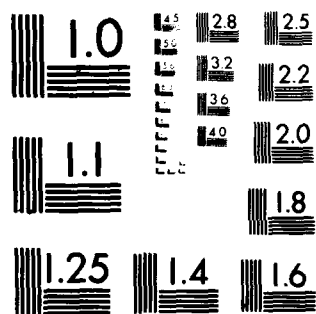
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END
DATE
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

PLOTTING PROGRAM FOR DISSPLA 4 JAN 1980
ANSWER QUESTIONS AS EITHER FLOATING PT. (F.P.) VALUES OR AS
INTEGER (I) VALUES AS INDICATED. ANSWER DEFINITIVE
QUESTIONS WITH EITHER Y FOR YES OR N FOR NO.

INPUT DATA FOR NEW CURVE (Y OR N) ?
END TEK4010 N

SAVE FOR CALCOMP PLOTTER (Y OR N) ?Y

<<<< TYPE IN," DRAW=1\$ ", FOR DISSPLA DIRECTIVES >>>>

DISSPLA POSTPROCESSOR FOR 1038 CALCOMP PLOTTER.
READING DIRECTIVES.

END PLTD

.035 CP SECONDS EXECUTION TIME

PFN IS

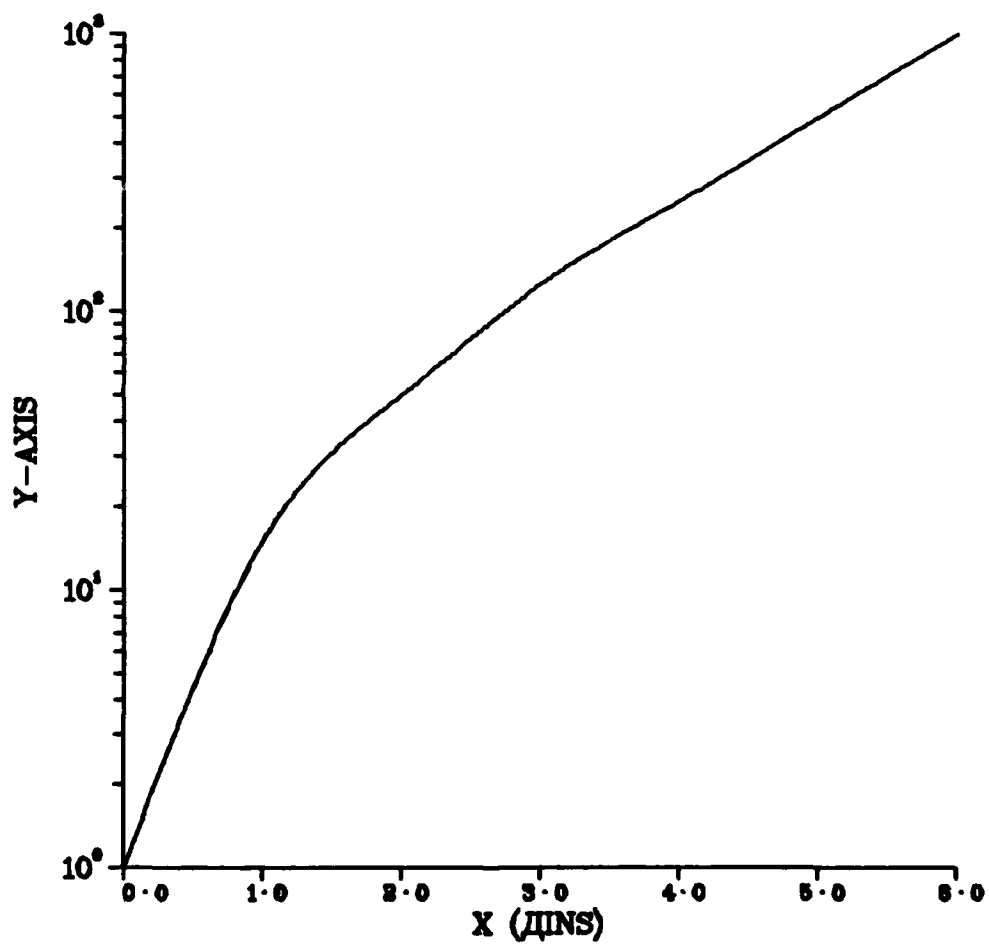
DISSPLA:

PFN IS

PLT1038:

PF CYCLE NO. = 001DRAW=1\$

Y SEMILOG PLOT



(Bold Lettering)

PLOTTING PROGRAM FOR DISPLA 4 JAN 1980
ANSWER QUESTIONS AS EITHER FLOATING PT. (F.P.) VALUES OR AS
INTEGER (I) VALUES AS INDICATED. ANSWER DEFINITIVE
QUESTIONS WITH EITHER Y FOR YES OR N FOR NO

INPUT DATA FOR NEW CURVE (Y OR N) ?N

SAVE FOR CALCOMP PLOTTER (Y OR N) ?N
STOP

.028 CP SECONDS EXECUTION TIME
COMMAND- LOGOUT

AFAPL-TR-78-90

REFERENCES

Integrated Software Systems Corporation, "DISSPLA, Beginners/Intermediate Manual", Vol. 1 , 1973

ASD Computer Center, CDC NOS/BE User's Guide, Revision E, January 1978, p. 5-12

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